



OSAC RESEARCH NEEDS ASSESSMENT FORM

Title of research need:

Keyword(s):

Submitting subcommittee(s): **Date Approved:**

(If SAC review identifies additional subcommittees, add them to the box above.)

Background Information:

1. Description of research need:

Most fire investigators current rely on subjective analysis of fire patterns. Measurable techniques for analyzing fire patterns would improve the reliability and validity of using this data to determine fire origin. NFPA 921 has information on calcination and char depth measurements as a tool to assist in origin determination. Many consider these techniques to be imprecise and of questionable value. They are not employed by most fire investigators because of the time required and because of a lack of perceived usefulness. Additionally, there is little data on how differences in material composition of construction components such as gypsum wallboard may impact these techniques. Results of this research need to be reported in such a way that it is practical and usable by the fire investigator. The protocols and techniques developed need to be in a form that supports analysis of fire growth in the compartment.

2. Key bibliographic references relating to this research need:

Gorbett, G., Morris, S., Meacham, B., and Wood, C. (2014). A New Method for the Characterization of the Degree of Fire Damage to Gypsum Wallboard for Use in Fire Investigations. *Journal of Forensic Science*, doi: 10.1111/1556-4029.12616, **60**, p. S-193-196.

Madrzykowski, D., Fleischmann, C. (2012). Fire Pattern Repeatability: A Study in Repeatability. *Journal of Testing and Evaluation* **40**. Doi: 10.1520/JTE104261

Mealy, D., Gottuk, D. (2012). A Study of Calcination of Gypsum Wallboard. Paper presented at the International Symposium on Fire Investigations. Investigations Institute, Florida.

Kozhumal, S., Hicks, W., Sezer, H. (2019). *Numerical Investigation of Gypsum Thermo-Chemistry Under Fire Exposure*. National Combustion Meeting.

3a. In what ways would the research results improve current laboratory capabilities?

This research will help laboratories to better determine which instrumentation is appropriate for large scale fire testing as well as what data should be measured, documented and published.

3b. In what ways would the research results improve understanding of the scientific basis for the subcommittee(s)?

3c. In what ways would the research results improve services to the criminal justice system?

This research will help the fire investigation community to apply a more systematic approach to the results of fire pattern analysis.

4. Status assessment (I, II, III, or IV):

	Major gap in current knowledge	Minor gap in current knowledge
No or limited current research is being conducted	I	III
Existing current research is being conducted	II	IV

This research need has been identified by one or more subcommittees of OSAC and is being provided as an informational resource to the community.

Approvals:

Subcommittee	Approval date: <input style="width: 100px;" type="text"/>
<i>(Approval is by majority vote of subcommittee. Once approved, forward to SAC.)</i>	

SAC		
1. Does the SAC agree with the research need?	Yes <input style="width: 30px;" type="checkbox"/>	No <input style="width: 30px;" type="checkbox"/>
2. Does the SAC agree with the status assessment?	Yes <input style="width: 30px;" type="checkbox"/>	No <input style="width: 30px;" type="checkbox"/>
If no, what is the status assessment of the SAC:	<input style="width: 100px;" type="text"/>	
Approval date:	<input style="width: 100px;" type="text"/>	
<i>(Approval is by majority vote of SAC. Once approved, forward to NIST for posting.)</i>		